Rifle, Colorado, Disposal Site

Long-Term Surveillance and Maintenance Program

U.S. Department of Energy
Grand Junction Office

FACT SHEET

The Grand Junction Office has provided cost-effective and efficient stewardship for more than 10 years

Overview

Uranium and vanadium ores were processed at two millsites near Rifle, Colorado, between 1924 through 1981. Milling operations created process-related wastes and tailings, a sandlike waste product containing radioactive materials and other contaminants. In 1996, the U.S. Department of Energy (DOE) encapsulated the tailings from the two millsites in an engineered disposal cell at Estes Gulch, north of Rifle.

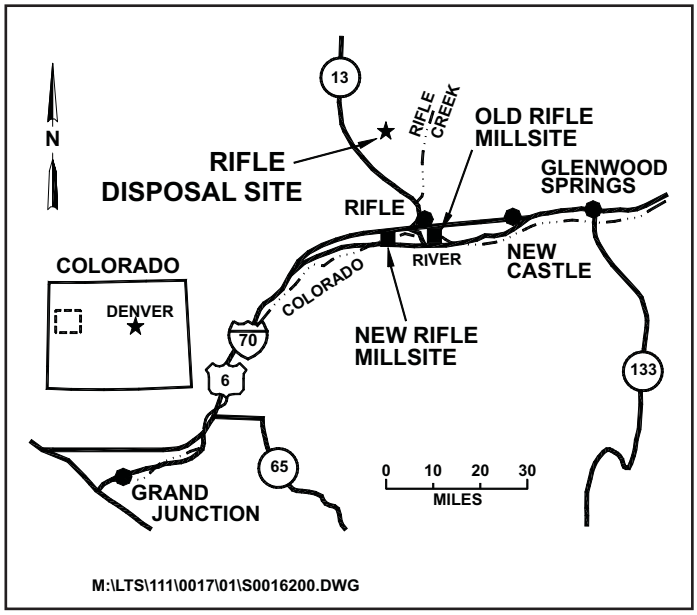
The U.S. Nuclear Regulatory Commission included the Rifle Disposal Cell under general license in 1998. DOE is responsible, under the general license, for the long-term custody, monitoring, and maintenance of the site. The DOE Long-Term Surveillance and Maintenance (LTSM) Program at the DOE Grand Junction (Colorado) Office is responsible for the long-term safety and integrity of the disposal site.

In 1988, DOE established the LTSM Program to provide stewardship of disposal cells that contain low-level radioactive material after completion of environmental restoration activities. The mission of the LTSM Program is to ensure that the disposal cells continue to prevent the release of contaminated materials to the environment. These materials will remain potentially hazardous for thousands of years. As long as the disposal cells function as designed, risks to human health and the environment are negligible.

The LTSM Program maintains the safety and integrity of the disposal cell through periodic monitoring, inspections, and maintenance; serves as a point of contact for stakeholders; and maintains an information repository at the DOE Grand Junction Office for all sites in the LTSM Program.

Regulatory Setting

Congress passed the Uranium Mill Tailings Radiation Control Act in 1978 (Public Law 95–604) that identified 24 inactive millsites for remedial action where uranium was produced for the Federal Government. DOE remediated these sites under the Uranium Mill Tailings Remedial Action Project and encapsulated the radioactive material in U.S. Nuclear Regulatory Commission-approved disposal cells. Cleanup standards were promulgated by the U.S. Environmental Protection Agency in Title 40 *Code of Federal Regulations* (CFR) Part 192. The U.S. Nuclear Regulatory Commission license was issued in accordance with 10 CFR 40.



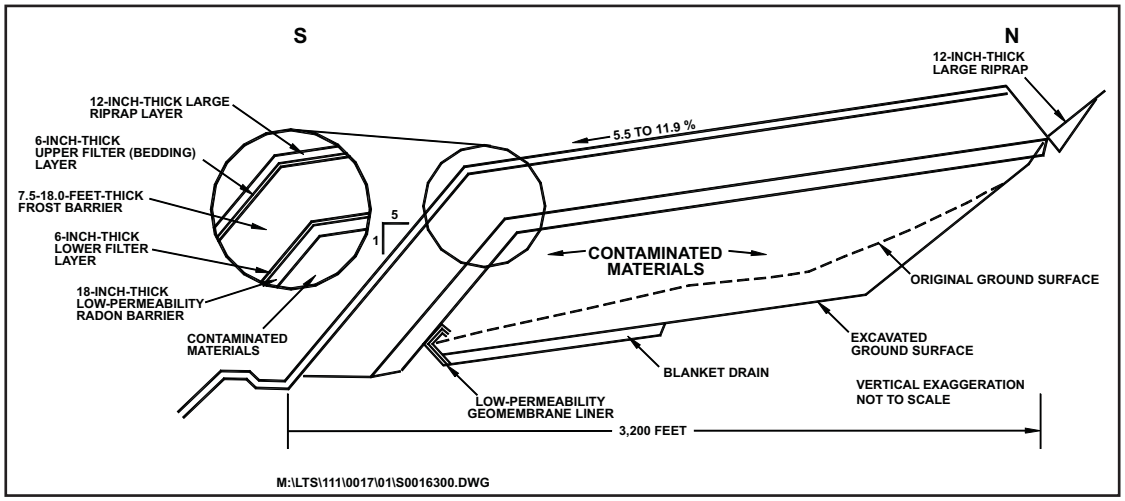
Rifle Disposal Site

The Rifle Disposal Site is in Garfield County, Colorado, approximately 6 miles north of the town of Rifle. In August 1991, the U.S. Bureau of Land Management permanently transferred administration of 205 acres to DOE for use as the Rifle Disposal Site. The predominant land use in the area is grazing; the immediate surrounding region is sparsely populated. Warning signs mark the site perimeter, which is partially fenced to control grazing.

The disposal site is underlain by the Wasatch Formation. The Wasatch is considered to be an aquitard and does not contain significant quantities of groundwater. The groundwater in the Wasatch Formation is characterized as limited use. This means the groundwater is not a current or future source of potable water because of poor quality and low yield.

The two former millsites were located on the floodplain of the Colorado River south of the city of Rifle. Standard Chemical Company built the Old Rifle mill in 1924 and sold the operation to United States Vanadium Corporation (a successor to Union Carbide Corporation) in 1928. The mill was operated to recover vanadium from 1924 to 1932 and again from 1942 to

1946. In 1946, uranium processing was added to the vanadium recovery circuit, and recovery of both minerals continued until 1958. In 1958, production was transferred to Union Carbide Corporation's New Rifle mill, where uranium and vanadium oxides were extracted until December 1972. After 1972, only vanadium was produced at the New Rifle mill; processing operations ceased in 1981.



South-North Cross Section of Rifle Disposal Cell

Some of the tailings generated at the Old Rifle millsite were later hauled to the New Rifle mill and reprocessed. An estimated 350,000 tons of tailings was left at the Old Rifle millsite, covering an area of approximately 13 acres. The New Rifle mill processed approximately 2,700,000 tons of material, resulting in an almost equal amount of tailings that occupied approximately 33 acres.

In 1992, the U.S. Nuclear Regulatory Commission and the State of Colorado concurred with DOE's remedial action plan that specified moving tailings from the two millsites and contaminated materials from vicinity properties in the Rifle area to the Estes Gulch site. DOE began constructing the disposal cell in 1993. The disposal cell was completed in 1996. The cell contains 4,967,451 dry tons of contaminated materials, with a total activity of 2,738 curies of radium-226.

Cell Design

The Rifle Disposal Site is located at the head of a small drainage basin on a dissected pediment and alluvial fan surface. The ground slopes southwest toward Government Creek from the foot of the Grand Hogback monocline. The cell measures approximately 3,000 feet in length by 2,900 feet in width at its base and covers an area of 71 acres on the 205-acre site.

The cover of the Rifle Disposal Cell is a multicomponent cover designed to isolate the contaminated materials from the environment for 1,000 years. A low-permeability radon barrier, consisting of multiple layers of compacted clay and clay soil, was placed over the contaminated materials. The radon barrier was covered with a free-draining filter layer, over which was placed a thick frost-protection layer consisting of compacted soil. The top slope and side slopes were capped with a bedding layer and riprap (large diameter rock) to protect against wind and water erosion. The cell design promotes rapid runoff of precipitation to minimize leachate. A riprap apron and ditch at the toe of the disposal cell carry water away from the cell. An unlined interceptor ditch abuts the up-slope portion of the disposal cell to divert surface flow away from the cell. A leachate collection system, installed at the toe of the cell, will be decommissioned after transient pore water seepage has ceased. Natural vegetation was re-established in the disturbed areas at the site.

LTSM Program Activities

The LTSM Program manages the site according to a long-term surveillance plan (LTSP) prepared specifically for the Rifle site. Under provisions of the LTSP, the LTSM Program conducts annual inspections of this site to evaluate the condition of surface features and performs site maintenance as necessary. In addition, DOE monitors water levels in two standpipes installed in the lower part of the disposal cell.

The disposal cell at Rifle is designed and constructed to last for 200 to 1,000 years. However, the general license has no expiration date, and DOE understands that its responsibility for the safety and integrity of the Rifle site will last indefinitely.

Contacts

For more information about the LTSM Program or about the Rifle Disposal Site, contact

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or visit the Internet site at
http://www.gjo.doe.gov/programs/ltsm